In The Claims:

1. (Cancelled)

2. (Currently Amended) ~~A method as recited in claim 1 further comprising~~ A method for detecting a roll rate sensor fault comprising: generating a reference roll angle; generating a roll rate sensor signal; comparing said reference roll angle to said roll rate sensor signal; generating a roll rate sensor fault signal in response to comparing said reference roll angle to said roll rate sensor signal; and compensating for a valid signal bias in said roll rate sensor signal.

3. (Original) A method as recited in claim 2, wherein compensating for a valid signal bias further comprises adjusting an electrical long term bias over time with a minute adjustment at each sampling time or a sliding mode control.

4. (Original) A method as recited in claim 2, wherein compensating for a valid signal bias further comprises adjusting a mechanical long term sensor alignment pitch angle with a minute adjustment at each sampling time during vehicle turning or a sliding mode control during vehicle turning.

5. (Original) A method as recited in claim 2, wherein compensating for a valid signal bias further comprises halting roll rate sensor signal compensation in response to a fault flag or in response to a situation where compensation is unnecessary.

6. (Currently Amended) A method as recited in claim [1] 2, wherein generating said reference roll angle further comprises sensing at least one of lateral acceleration, yaw rate, vehicle longitudinal speed, vehicle roll angle, wheel speed, or a GPS.

7. (Currently Amended) A method as recited in claim [1] 2 further comprising refining said reference roll angle through steering wheel angle information to reduce a negligence error of a lateral velocity derivative.

8. (Currently Amended) A method as recited in claim [1] 2 further comprising refining said reference roll angle with a calculation of a dynamic relation between a vehicle lateral acceleration and a suspension roll motion.

9. (Currently Amended) A method as recited in claim [1] 2, wherein comparing said reference roll angle to said roll rate sensor signal comprises comparing a low pass filter version of a derivative of said reference roll angle with said roll rate sensor signal.

10. (Currently Amended) A method as recited in claim [1] 2, wherein comparing said reference roll angle to said roll rate sensor signal comprises comparing a high pass filtered reference roll angle with a high pass filtered version of an integration of said roll rate sensor signal.

11. (Currently Amended) A method as recited in claim [1] 2, wherein comparing said reference roll angle to said roll rate sensor signal comprises comparing said reference

roll angle and said roll rate sensor signal through building a filter utilizing both a suspension dynamics and a kinematics relationship between roll angle and roll rate.

12. (Currently Amended) A method as recited in claim [1] 2, wherein comparing said reference roll angle to said roll rate sensor signal comprises comparing said reference roll angle to said roll rate sensor signal through an observer that utilizes a kinematics relation and a dynamics relation.

13. (Currently Amended) A method as recited in claim [1] 2, wherein comparing said reference roll angle to said roll rate sensor signal further comprises utilizing generating a dynamic bias estimate with a logic having said vehicle roll rate signal averaging to zero over a long period of time.

14. (Currently Amended) A method as recited in claim [1] 2, wherein generating said roll rate sensor fault signal further comprises generating a lateral acceleration signal; filtering said lateral acceleration signal; generating a filtered lateral acceleration signal; high pass filtering said roll rate sensor signal; generating a filtered roll rate sensor signal; and comparing said filtered lateral acceleration signal to said filtered roll rate sensor signal.

15. (Currently Amended) A method as recited in claim [1] 2 further comprising shutting down a safety system in response to roll rate sensor fault or error.

16. (Currently Amended) A method as recited in claim [1] 2 further comprising generating a substitute signal for said roll rate signal in response to roll rate sensor fault.

17. (Original) A method for detecting a roll rate sensor fault comprising: generating a reference roll angle in an inertial frame with available signals other than roll rate; generating a roll rate sensor signal; compensating said roll rate sensor signal for all valid signal biases;
comparing said reference roll angle to said roll rate sensor signal through a kinematics relation and a dynamic interaction related by a vehicle suspension; and generating a roll rate sensor fault signal comparing said reference roll angle to said roll rate sensor signal.

18. (Original) A method as recited in claim 17, wherein compensating for a valid signal bias further comprises halting roll rate sensor signal compensation in response to a fault flag or in response to a situation where compensation is unnecessary.

19. (Original) A method as recited in claim 17, wherein generating said roll rate sensor fault signal further comprises generating a lateral acceleration signal; filtering said lateral acceleration signal; generating a filtered lateral acceleration signal;
high pass filtering said roll rate sensor signal; generating a filtered roll rate sensor signal; and comparing said filtered lateral acceleration signal to said filtered roll rate sensor signal.

20. (Original) A method as recited in claim 17 further comprising refining said reference roll angle with a calculation of a dynamic relation between a vehicle lateral acceleration and a suspension roll motion.

21. (Cancelled)

22. (Currently Amended) ~~A system as recited in claim 21,~~ A control system for an automotive vehicle having a vehicle body comprising: a sensor cluster having a housing oriented within the vehicle body; a roll rate sensor positioned within the housing adapted to generate a roll rate sensor signal corresponding to an roll angular motion of the sensor housing; and a controller adapted to receive said roll rate sensor signal, said controller further adapted to generate a reference roll angle, and compare said reference roll angle to said roll rate sensor signal, said controller further adapted to generate a roll rate sensor fault signal in response to a fault determined in said roll rate sensor, wherein said controller is further adapted to compensate said roll rate sensor signal for all valid signal biases.

23. (Currently Amended) A system as recited in claim [21] 22, wherein said controller is further adapted to refine said reference roll angle through steering wheel angle information.

24. (Currently Amended) A system as recited in claim [21] 22, wherein said controller is further adapted to shut down a roll over detection system in response to said roll rate sensor fault signal.

25. (Currently Amended) A system as recited in claim [21] 22, wherein said controller is further adapted to generate a substitute roll rate signal from sensor signals from at least one of a lateral accelerometer, a longitudinal accelerometer, a vertical accelerometer, a yaw rate sensor, a pitch rate sensor, a wheel speed sensor, a steering angle sensor ~~(hand-wheel sensor)~~, or a steering angle position sensor ~~(road-wheel sensors)~~.

26. (Original) A method for detecting a vehicle-dynamic sensor fault comprising: generating a reference vehicle-dynamic sensor signal; generating a vehicle-dynamic sensor signal; and compensating for a valid signal bias in said vehicle-dynamic sensor signal by adjusting a mechanical long term sensor alignment angle with a minute adjustment at each sampling time during a vehicle operation.

27. (Original) The method of claim 26 further comprising comparing said reference vehicle-dynamic sensor signal to said vehicle-dynamic sensor signal.

28. (Original) The method of claim 27 further comprising generating a sensor fault signal.